

UDC 595.792

REVIEW OF THE GENUS *ENTEDON* (HYMENOPTERA, EULOPHIDAE, ENTEDONINAE) 3. REVIEW OF THE *KERTESZI* SPECIES GROUP

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Accepted 29 May 1997

Review of the Genus *Entedon* (Hymenoptera, Eulophidae, Entedoninae). 3. Revision of the *kerteszi* Species Group. Gumovsky A. V. — Species of *kerteszi* species group of subgenus *Entedon* in the genus *Entedon* are reviewed. Two species are recognized for the group: palaearctic *E. (E.) kerteszi* Erdős (known from Hungary, Bulgaria and Mongolia) and nearctic *E. (E.) occidentalis* Girault (known from USA and Canada). Diagnosis of the group, redescrptions of the species included, the characters distinguishing the two species and new geographical records are proposed.

Key words: Hymenoptera, Eulophidae, Entedoninae, *Entedon*, species groups, Palaearctic, Nearctic.

Обзор рода *Entedon* (Hymenoptera, Eulophidae, Entedoninae). 3. Ревизия группы видов *kerteszi*. Гумовский А. В. — В статье предложен обзор группы видов *kerteszi* подрода *Entedon* рода *Entedon*. В данную группу включены палеарктический *E. (E.) kerteszi* Erdős (указан из Венгрии, Болгарии и Монголии) и неарктический *E. (E.) occidentalis* Girault (указан из США и Канады). В работе приводится диагноз исследованной группы, переописания включенных в нее видов, их сравнительные диагнозы и новые данные о распространении.

Ключевые слова: Hymenoptera, Eulophidae, Entedoninae, *Entedon*, группы видов, Палеарктика, Неарктика.

Introduction

This paper continues comparative study of genus *Entedon* Dalman (Hymenoptera, Eulophidae, Entedoninae). Subgenera *Entedon* (cosmopolitan) and *Cederholmia* (known only from Africa) were proposed for the genus, and species groups *squamosus*, *crassiscapus*, *cioni*, *hercyna*, *cyanellus*, *costalis*, *sparetus*, and *kerteszi* were recognized in the subgenus *Entedon* (Gumovsky, 1997).

Girault (1916) described *E. occidentalis* from 7 specimens, two of them were labeled as types. Schauff (1988) designated the labeled specimens as lectotype and paralectotype respectively, provided brief diagnosis of this species, additional information on its distribution, as well as compared it with other North American species.

Erdős (1944) described *Entedon kerteszi* as one of species included into the subgenus *Dolichentedon* of the *Entedon*. Later Graham (1963; 1971) proposed species group division instead of division into subgenera proposed by Erdős (loc. cit.), but no attention was paid to *Entedon kerteszi*, and this species proved to be unplaced. Szelényi (1978) recorded *Entedon kerteszi* from Mongolia.

Gumovsky (1997) proposed to place *E. (E.) kerteszi* and *E. (E.) occidentalis* in separate species group *kerteszi* of the subgenus *Entedon*, basing on their monophyly in having produced forwards anterior margin of clypeus and one pale frontal stripe on fore tibia. Expanded concept of the species group is proposed below.

Species-group *kerteszi*

Description. Both sexes: frontal fork absent, venation of fore wing dark brown, marginal vein more (*E. (E.) kerteszi*) or less (*E. (E.) occidentalis*) thickened at whole its length, shorter (*E. (E.) kerteszi*) or of the same length (*E. (E.) occidentalis*) as costal cell. Break of submarginal vein distinct: hind margin of parastigma placed much lower, than submarginal vein; submarginal vein before its "break" where it meets papastigma bears 2 (*E. (E.) kerteszi*) or 3–4 (*E. (E.) occidentalis*) setae on its dorsal side. Occipital

margin marked off, but not toothed; anterior margin of clypeus produced forwards; propodeum with spiracular elevations delimited only laterally, their projections dull; posterior margin of supracoxal groove completely fused with supracoxal flange, depression between spiracular lateral groove and supracoxal groove shallow and almost invisible (lateral sulcus incomplete), submedian areas flat, smooth, with weakly indicated (*E. (E.) kerteszi*) or distinct (*E. (E.) occidentalis*) reticulation; median carina often with distinct lateral furrows; supracoxal flange well developed; petiole reduced to narrow band; fore tibiae with one frontal pale strip, their anterior apices with projecting spine either rest tibiae almost completely darkened except for lighter tips, their posterior apices with thick spurs; trochanters always darkened; speculum open in both known species.

Male (known only for *E. (E.) occidentalis*): similar to female; antennal funicle 3-segmented, gaster without basal light-colored spot.

Discussion. Representatives of this species group share the following characters:

— with representatives of the *costalis* species group: the combination of produced forwards anterior margin of clypeus, thick femora, mostly dark mid and hind tibiae, projecting spines of fore tibial apices;

— with representatives of the *cyanellus* species group: the projecting spines of fore tibial apices and the produced forwards anterior margin of clypeus;

— with representatives of the *spretus* species group: fore tibia with one pale frontal stripe.

Females of the species included in this group differ as in Table 1.

Entedon (Entedon) kerteszi Erdős

Entedon kerteszi Erdős, 1944: 35; Szélényi, 1978: 214; Gumovsky, 1997: 34.

Type materials. Holotype: ♀, Hungary: Apajpuszta, 6.V.1894, Hungary, Kertész leg., № 4942 (TMB).

Other materials: ♀, Hungary: Szabadka, Coll. A. Taubert, 23.VII.1924; ♀, same, 27.VII.1938; ♀, Bulgaria: Traŭia, Stoykovo, 89. V. 21, (Podlussany); 2 ♀, same, 27.IV.1990 (TMB).

Female. Length 3.75 mm (holotype, Fig. 1)–4.6 mm. Body dark blue. Antennae blackish. Scape and pedicel with blue metallic tint. Tips of femora and tibiae narrowly yellow to light brown; fore tibiae with 1 frontal stripe darkening in proximal part; fore tarsi dark; 1st segment of the mid and hind tarsi light brown, next ones dark brown, venation of wings light brown, wings hyaline.

Head in dorsal view (Fig. 1, 5) 2.3–2.5 times as broad as long; POL 1.5–1.7 OOL, ocelli small, hind ocellus separated from eye by distance as long as or slightly shorter than its own double major diameter, and separated from occipital margin by distance 1/2–3/5 its own major diameter. Occipital margin hardly carinated, at most sharp in the middle part, strongly rounded laterally. Eye sometimes with several spots and very short sparse pilosity, eye height 3.57 times as long as malar space.

Head in frontal view (Fig. 1, 4) 1.4 times as broad as long. Interocular distance

Table 1. Differences between females *E. (E.) kerteszi* and *E. (E.) occidentalis*

Таблица 1. Сравнительный диагноз самок *E. (E.) kerteszi* и *E. (E.) occidentalis*

Character	<i>E. (E.) kerteszi</i> Erdős	<i>E. (E.) occidentalis</i> Girault
Gaster: length/breadth	3	1.5–1.7
1st funicular segment: length/breadth	2.0–2.5	2.9–3.75
1st funicular segment/2nd	1.1–1.22	1.36–1.4
Surface of propodeum	smooth or alutaceous	densely reticulated
Number of setae on dorsal surface of submarginal vein before its "break"	2	3–4
Head: breadth/length	2.4–2.5	2.1–2.3
Temples	truncate	produced laterally
Distribution	Palearctic	Nearctic

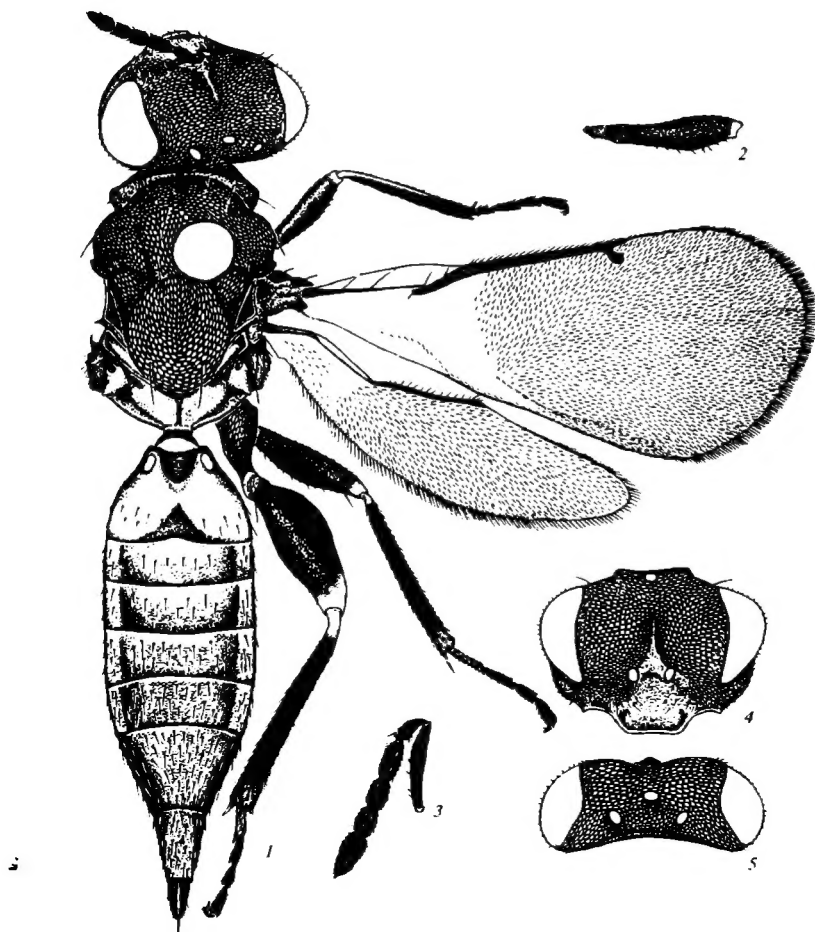


Fig. 1. *Entedon (Entedon) kerteszi*, ♀, holotype: 1 — habitus; 2 — fore femur; 3 — antenna; 4, 5 — head views: 4 — frontal, 5 — dorsal.

Рис. 1. *Entedon (Entedon) kerteszi*, ♀, голотип: 1 — габитус; 2 — переднее бедро; 3 — усик; 4, 5 — голова: 4 — спереди, 5 — сверху.

3.53 times as long as eye breadth. Oral fossa 4.3–4.7 times as broad as length of malar space. Anterior margin of clypeus distinctly produced forwards. Antennae (Fig. 1, 3) inserted slightly above level of ventral eye margins. Scape slender, 0.7 times as long as eye height, 5.2–6.0 times as long as broad; combined length of pedicellus and flagellum about 0.8 of breadth of head; pedicellus 2.0–2.2 times as long as broad, 1st funicular segment 2.0–2.4 times as long as broad, 1.22 times as long as 2nd, which 1.7–1.8 times as long as broad, 3rd funicular segment 1.3 times, clava twice as long as broad.

Thorax 1.4 times as long as broad. Pronotal collar not marked off. Mesoscutum 1.6–1.76, times as broad as long, the parapsidal grooves not marked off. Scutellum 1.15 times as long as broad, 1.36 times as long as mesoscutum, densely reticulated; propodeum almost smooth, but not shiny (in lectotype left lobe with very slightly indicated meshes, median carina complete, with more or less indicated channels aside; supracoxal flange and nucha of moderate size. Fore femur (Fig. 1, 2) about 3.7 times as long as broad, fore tibia 8.5–8.6 times as long as broad, with prominent apical spine, its length 1/2–2/3 of breadth of tibia; spur of fore tibia short, invisible; mid femur 3.5–4 times as long as broad; mid tibia about 11 times as long as broad, spur of

mid tibia 1.4–1.5 times as long as breadth of tibia; hind femur 2.8–2.9 times as long as broad, hind tibia 8.7–9.5 as long as broad, spur of hind tibiae slightly shorter than breadth of its tibia.

Fore wing 2.2–2.4 times as long as broad; costal cell bare, 7–8.5 times as long as broad, 0.8 times as long as marginal vein; submarginal vein with 2 dorsal setae before its "break", where it meets parastigma; postmarginal vein about 1/2 of stigmal, the latter petiolate, drop-shaped; speculum mostly open, sometimes 2–3 setae placed near hind end of parastigma, cubital vein represented by short row of setae; fringe of apical margin broad, its length as long as or slightly longer than breadth of marginal vein in small specimens, shorter in bigger specimens.

Gastral petiole strongly transverse. Gaster elongate, nearly twice as long as combined length of head plus thorax, 3 times as long as broad. Basal gastral tergite with several hairs, its posterior margin medially excised, following terga haired with longer setae.

Male. Unknown.

Host. Unknown.

Distribution. Hungary (Erdős, 1944); Mongolia (Szclényi, 1977); new for Bulgaria.

Remark. Holotype specimen is the smallest among all studied ones.

Entedon (Entedon) occidentalis Girault

Entedon occidentalis Girault, 1916: 48; Schauff, 1988: 53; Gumovsky, 1997: 34.

Materials. USA, California: 2 ♀, Claremont, (Baker) (USNM); ♀, Apple Valley, 9.V.1955, (J. E. H. Martin) (CNC); ♂, Pacines, 17 mi S San Benito Co., IV-24-68; ♂, Alum Rock Park, Santa Clara Co., 20.IV.1962, (L. R. Breimeier); 2 ♀, (Tulare Co., Fairview, 9 mi S. 29.IV.19164, (J. Doyen); ♀, Ribbonwood, San Jacinto Mts., *Lupinus*, 20.V.1934, (E. S. Ross); 2 ♂, Mt. Hamilton, Santa Clara Co., 15.IV.1947, (G. E. Bohart); 2 ♀, Mt. Hamilton, 15.IV.1947, (G. Bohart); 2 ♀, Antioch, Contra Costa Co., 24.IV.19159, (C.W.O'Brien); ♂, Indian Wells, Kern County, 18.IV.19162, (C. A. Toschi); ♀, 3 ♂, Trinity Co., 4 mi. S Hayfork, *Lupinus*, 18.V.1973, (J. Powell); ♀, same locality, but 18/19.V.19173, (J. Doyen); 3 ♀, Yuba Co., Sierra, Foothill Field Sta., 5 mi. N. Smartville 1300-1500', 4.V.1980, (J. T. Doyen); ♀, same time and locality, but (M. E. Buegler); 2 ♀, the same time and locality, but (J. DeBenedictis); ♀, Monterey Co., Horse Bridge, 1.5 air mi, SW Arroyo Sego G. Sta., 1300', collected on *Lupinus*, 3/7.V.19175, (J. Powell); ♀, Lockwood, 3.IV.1957, (R. P. Allen); ♀, Burney, Shasta Co., *Lupinus*, 9.VI.19141, (P. D. Hurd) (EMUCR); USA, Colorado: ♀, Boulder, 5500, 9.VI.1961, (B. H. Poole) (CNC); Canada, Alberta: ♀, Berwyn, Alta. (Z's), 15.VI.1940, (C. L. Neilson) (CNC); Canada, British Columbia: ♂, Vaseaux L., Oliver B. C., 29.V.1959, (L. A. Kelton); 2 ♀, Richter Pass., Osoyoos B. C., "*Artemisia*", 24.V.1959, (R. Madge); ♀, ♂, BC, Oliver, White Lk, 28.V.1959, (E. E. MacDougall); ♀, Lethbridge, Alta., 18.VI.19150, (B. P. Beine) (CNC); ♂, "4A19" (CNC).

Female (Fig. 2, 1). Length 4.4–4.9 mm. Body green-blue. Antennae blackish, with green metallic tint on scape and pedicel. Tips of femora narrowly yellow, posterior end of hind tibia light in about its outer 1/6, mid tibiae narrowly light in outer part of its posterior end; fore tibiae with 1 complete frontal stripe; all tarsi dark brown; venation of wings dark brown, often with infumation along veins, also basal and cubital veins marked off by stripes of brown infumation.

Head in dorsal view (Fig. 2, 5) 2.1–2.3 times as broad as long, temples produced laterally as weakly protruding bulges; POL 1.5–1.9 OOL, ocelli of moderate size, hind ocellus separated from the eye margin by distance slightly shorter than its double major diameter, and separated from occipital margin by distance as long as or slightly shorter than its major diameter.

Occipital carina little, but clear, interrupted and slightly raised laterally. Eye with very short sparse pilosity, eye height 3.5 times as long as malar space.

Head in frontal view (Fig. 2, 4) 1.38–1.4 times as broad as long. Interocular distance 4.5 times as long as eye breadth. Oral fossa 4.4–4.6 times as broad as length of malar space. Anterior margin of clypeus distinctly produced forwards, slightly concave medially. Antennae (Fig. 2, 3) inserted slightly above level of ventral eye margins.

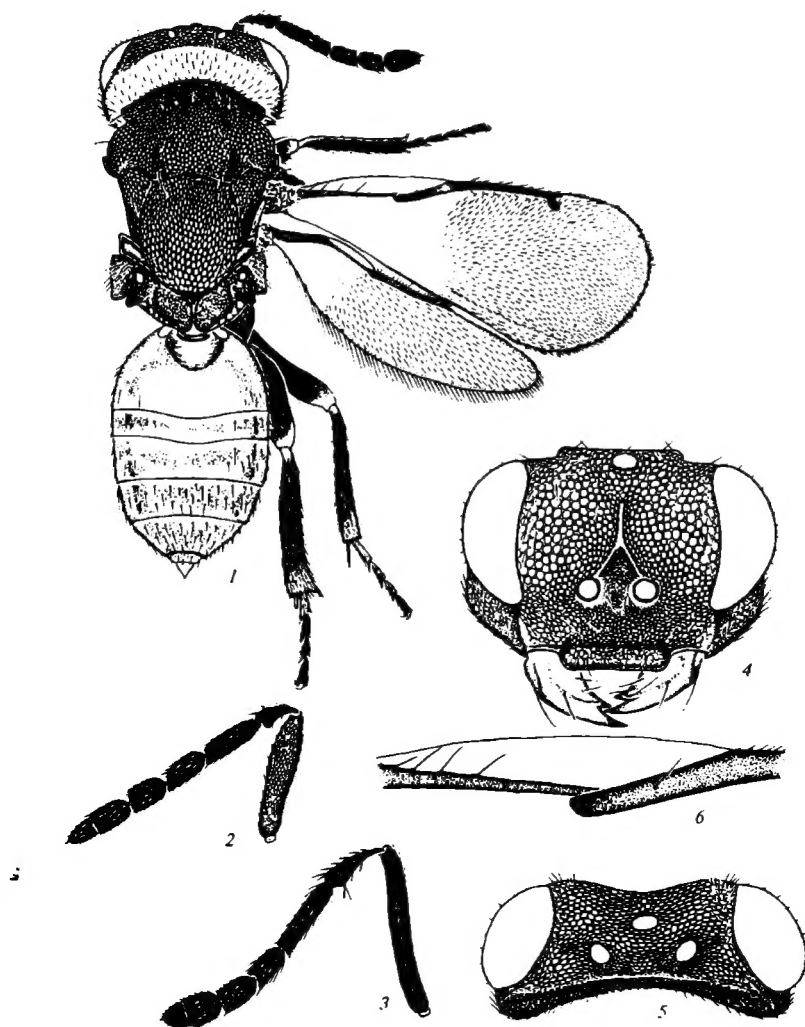


Fig. 2. *Entedon (Entedon) occidentalis*: 1 — female habitus; 2 — female antenna; 3 — male antenna; 4, 5 — female head views: 4 — frontal, 5 — dorsal; 6 — submarginal vein of female fore wing.

Рис. 2. *Entedon (Entedon) occidentalis*: 1 — габитус самки; 2 — усик самки; 3 — усик самца; 4, 5 — голова самки: 4 — спереди, 5 — сверху; 6 — субмаргинальная жилка переднего крыла самки.

Scape short, 0.75 times as long as eye height, 5.6 times as long as broad; combined length of pedicellus and flagellum 0.7–0.8 times of breadth of head; pedicellus 2.4 times as long as broad. 1st funicular segment 2.9–3.75 times, 1.36–1.4 times as long as second, 2nd 1.83–2.2 times, 3rd 1.2–1.3 times, clava 1.62–1.75 times as long as broad, with very short, but distinct terminal spine.

Thorax with propodeum about 1.5 times as long as broad. Pronotal collar marked off by quite sharp carina bearing 8 dorsal setae. Mesoscutum 1.74–1.88 times as broad as long, the parapsidal grooves reduced, just poorly indicated by shallow grooves near scutellum. Scutellum slightly longer than broad (in ratio as 56/51, 51/46), 1.1–1.22 times as long as mesoscutum; propodeum densely reticulated throughout, median carina complete, somewhat diverging apically; with deep, often margined lateral furrows; lateral sulcus traceable, supracoxal flange wide, nucha narrow, triangular, spiracular elevation with elongate projection, triangular in shape, propodeal calli with more than 20 setae. Fore femur 3.1–3.5 — times as long as broad, fore tibiae about 8 times as

long as broad, with distinct, but short apical spine, its length 1/3 of breadth of tibia; spur of fore tibia short stout, slightly longer than apical spine, about 2/3 of breadth of the tibia; mid femur 4.1–5.4 times as long as broad; mid tibia 7.2–9.6 times as long as broad, spur of mid tibia 1.4–1.6 times as long as breadth of tibia; hind femur 2.7–2.9 times as long as broad, hind tibia 6.0–6.3 times as long as broad, spur of hind tibiae 0.4 times as long as breadth of the tibia. Femora and tibiae densely setose, points of insertions of setae sometimes raise making lateral margins of femora and tibiae to be virtually dentate.

Fore wing 2.3–2.4 times as long as broad; costal cell bare; 7.3–7.75 times as long as broad, 1.2–1.3 somewhat longer than marginal vein; submarginal vein with 3–4 dorsal setae before its “break”, where it meets parastigma (Fig. 2, 6); postmarginal vein slightly shorter than stigmal, which almost sessile, consisting of somewhat elongate stigma; speculum open, basal vein bare, cubital vein represented by short row of setae; fringe of apical margin about twice shorter than breadth of marginal vein in mid part.

Gastral petiole strongly transverse. Gaster elongate, 0.8 times as long as combined length of head plus thorax, 1.50–1.64 times as long as broad. Basal gastral tergite with several hairs on sides, following terga haired much densely setose.

Male. Differs from female as follows: breadth of oral fossa 5.2–5.4 times as long as malar space, antennal scape 0.8 times as long as eye height, 3.63–3.85 times as long as broad; combined length of pedicellus and flagellum 0.75–0.76 times of breadth of head; pedicellus 1.77–2.1 times as long as broad, 1st funicular segment 2.2–2.3 times, 1.36–1.55 times as long as 2nd, 2nd 1.8 times, 3rd 1.3–1.4 times, clava 2.0–2.6 times as long as broad. Stigma spherical, often wider than in female. Gaster subquadrate, 1.30–1.53 times as long as broad.

Discussion. Part of materials identified as *E. occidentalis* Girault by M. E. Schauff (9 ♀, 2 ♂, Montana, Wheatland Co., Deadman's Basin St. Rec. Area, 3,600', 5.VI.1982, (G. Gibson); 2 ♀, Colorado, Jefferson, 9400', 14.VII.1961", (S. M. Clark) (CNC)) belong to Holarctic *E. (E.) cyanellus* Dalman.

Host. Unknown. Probably associated with *Lupinus*.

Distribution: USA and Canada.

Acknowledgments

Material was borrowed from the following institutions and private collections, and the help of the respective curators and individuals is gratefully appreciated: L. Zombori and J. Papp (Természettudományi Múzeum, Budapest, Hungary = TMB), M. E. Schauff (U. S. Natural History National Museum, Washington, D. C., USA = USNM), John T. Huber (Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada = CNC), R. Zuparko and C. Barr (Essig Museum of University of California, Berkeley, USA = EMUCR).

I especially thank to Dr. Valery A. Korneyev (Schmalhausen Institute of Zoology, Kiev, Ukraine) for reading the manuscript and many useful comments.

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